

# **SLOVENSKI STANDARD**

## **SIST EN 14805:2009**

**01-januar-2009**

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**Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev klorid za pridobivanje klora po elektrokemijskem postopku brez uporabe membranske tehnologije**

Chemicals used for treatment of water intended for human consumption - Sodium chloride for on site electrochlorination using non-membrane technology

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumchlorid zur elektrochemischen Erzeugung von Chlor vor Ort mittels membranloser Verfahren

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Chlorure de sodium pour la génération électrochimique de chlore utilisant des technologies non membranaires

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**Ta slovenski standard je istoveten z: EN 14805:2008**

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**ICS:**

13.060.20	Pitna voda	Drinking water
71.100.80	Kemikalije za čiščenje vode	Chemicals for purification of water

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14805**

June 2008

ICS 71.100.80

English Version

**Chemicals used for treatment of water intended for human  
consumption - Sodium chloride for on site electrochlorination  
using non-membrane technology**

Produits chimiques utilisés pour le traitement de l'eau  
destinée à la consommation humaine - Chlorure de sodium  
pour la génération électrochimique de chlore utilisant des  
technologies non membranaires

Produkte zur Aufbereitung von Wasser für den  
menschlichen Gebrauch - Natriumchlorid zur  
elektrochemischen Erzeugung von Chlor vor Ort mittels  
membranloser Verfahren

This European Standard was approved by CEN on 29 May 2008.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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## Foreword

This document (EN 14805:2008) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2008, and conflicting national standards shall be withdrawn at the latest by December 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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## Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this European Standard:

- a) this European Standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;
- b) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

NOTE Conformity with this European Standard does not confer or imply acceptance or approval of the product in any of the Member States of the EU or EFTA. The use of the product covered by this European Standard is subject to regulation or control by National Authorities.

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## 1 Scope

This European Standard is applicable to sodium chloride intended for on site electrochlorination of water intended for human consumption using non-membrane technology. It describes the characteristics and specifies the requirements and the corresponding test methods for sodium chloride (see Annex B). It gives information on its use in water treatment.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 973:2002, *Chemicals used for treatment of water intended for human consumption — Sodium chloride for regeneration of ion exchangers*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

ISO 2479, *Sodium chloride for industrial use — Determination of matter insoluble in water or in acid and preparation of principal solutions for other determinations*

ISO 2480, *Sodium chloride for industrial use — Determination of sulphate content — Barium sulphate gravimetric method*

ISO 2482, *Sodium chloride for industrial use — Determination of calcium and magnesium contents — EDTA complexometric methods*

ISO 2483, *Sodium chloride for industrial use — Determination of the loss of mass at 110 degrees C*

ISO 3165, *Sampling of chemical products for industrial use — Safety in sampling*

ISO 6206, *Chemical products for industrial use — Sampling — Vocabulary*

ISO 6227, *Chemical products for industrial use — General method for determination of chloride ions — Potentiometric method*

ISO 8213, *Chemical products for industrial use — Sampling techniques — Solid chemical products in the form of particles varying from powders to coarse lumps*

## 3 Description

### 3.1 Identification

#### 3.1.1 Chemical name

Sodium chloride

#### 3.1.2 Synonym or common name

Salt

#### 3.1.3 Relative molecular mass

58,45

**EN 14805:2008 (E)****3.1.4 Empirical formula**

NaCl

**3.1.5 Chemical formula**

NaCl

**3.1.6 CAS Registry Number<sup>1)</sup>**

7647-14-5

**3.1.7 EINECS Reference<sup>2)</sup>**

231-598-3

**3.2 Commercial forms**

The product is available as rock salt, sea salt or evaporated salt, and it is supplied as free-flowing crystals or their compacted forms.

**3.3 Physical properties****3.3.1 Appearance**

The product is white and crystalline.

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**3.3.2 Density**

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The density of the solid crystal is 2,16 g/cm<sup>3</sup> at 20 °C.

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The bulk density depends on the particle size distribution.

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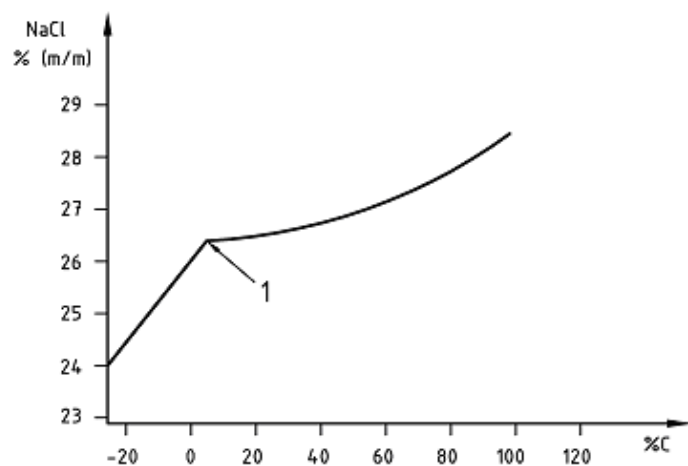
1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial chemical Substances Reference.



### 3.3.3 Solubility (in water)

The solubility of the product depends on the temperature as given in Figure 1.



Temperature °C	NaCl solution Mass fraction in %
- 10	25,0
0	26,34
10	26,35
20	26,43
30	26,56
40	26,71
50	26,89
60	27,09
70	27,30
80	27,53
90	27,80
100	28,12

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#### Key

- 1 transition point  
NaCl → NaCl · 2H<sub>2</sub>O

**Figure 1 — Solubility curve for sodium chloride in water**

### 3.3.4 Vapour pressure

Not applicable.

### 3.3.5 Boiling point at 100 kPa<sup>3)</sup>

Not applicable.

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3) 100 kPa = 1 bar

**EN 14805:2008 (E)****3.3.6 Melting point**

802 °C

**3.3.7 Specific heat**

Approximately 850 J/(kg·K) at 25 °C for the solid.

**3.3.8 Viscosity (dynamic)**

The viscosity of the saturated solution at 20 °C is approximately 1,9 mPa·s.

**3.3.9 Critical temperature**

Not applicable.

**3.3.10 Critical pressure**

Not applicable.

**3.3.11 Physical hardness**

The hardness of solid salt is given as 2 to 2,5 on the Mohs' scale of hardness.

**3.4 Chemical properties**

Sodium chloride is stable and non-volatile, and aqueous solutions have good electrical conductivity.

Sodium chloride is decomposed by a number of acids. It reacts with sulfuric acid, phosphoric acid and strong oxidizing agents. The reactions are often complex and require heat for completion.

NOTE Under certain conditions a sodium chloride solution can cause corrosion of metallic surfaces.

**4 Purity criteria****4.1 General**

This European Standard specifies the minimum purity requirements for sodium chloride for on site electrochlorination of water intended for human consumption using non-membrane technology. As the treatment chemical produced by this process is sodium hypochlorite, limits have been calculated from the requirements of EN 901 (sodium hypochlorite) for those impurities commonly present in the product and the chemical parameters. Consideration has also been given to the requirements of EN 973 (sodium chloride) for regeneration of ion exchangers. Depending on the raw material and the manufacturing process, other impurities may be present and, if so, this shall be notified to the user and, when necessary, to relevant authorities.

NOTE 1 Users of this product should check the national regulations in order to clarify whether it is of appropriate purity for the treatment of water intended for human consumption, taking into account raw water quality, required dosage, contents of other impurities and additives used in the product and not stated in this product standard.

NOTE 2 Using the sodium hypochlorite standard to define limits produces discrepancies with EN 973 regarding sodium chloride for the regeneration of ion exchange water softeners. This should not be taken to imply any real difference between the chemical purity between salt types meeting either specification.

Limits have been given for impurities and chemical parameters where these are likely to be present in significant quantities from the current production process and raw materials. If the production process or raw materials lead to significant quantities of impurities, by-products or additives being present, this shall be notified to the user.

## 4.2 Composition of commercial product

### 4.2.1 Sodium chloride content

The content of sodium chloride in the dry product shall not be less than:

Type 1: mass fraction of 99,9 % of dry sodium chloride, NaCl;

Type 2: mass fraction of 98,5 % of dry sodium chloride, NaCl.

### 4.2.2 Anticaking agent

Subject to any local legislation in member states, an anticaking agent, sodium or potassium hexacyanoferrate, is allowed up to a maximum level in the final product of 15 mg/kg, expressed as the anhydrous hexacyanoferrate ion  $[\text{Fe}(\text{CN}_6)]^{4-}$ ; for the determination, see B.3 of EN 973:2002. If gaseous free chlorine is produced as a stage in the electrochlorination process, the level of hexacyanoferrate ion present should be less than 3 mg/kg.

## 4.3 Impurities and main by-products

The product shall conform to the requirements specified in Table 1 and Table 2.

**Table 1 — Impurities**

Impurity	Limit in mass fraction in % of NaCl content		
		Type 1	Type 2
Water-insoluble matter	max.	0,05	0,35
Bromide	max.	0,025	0,05

**Table 2 — Moisture content**

Impurity	Limit in mass fraction in % of NaCl content		
		Dry salt	Un-dried salt
Moisture content	Max.	0,1	5

## 4.4 Chemical parameters

The product shall conform to the requirements specified in Table 3.

Table 3 — Chemical parameters

Parameter		Limits in mg/kg of commercial product	
		Type 1	Type 2
Arsenic (As)	max.	0,3	1,5
Cadmium (Cd)	max.	0,75	1,5
Chromium (Cr)	max.	0,75	1,5
Mercury (Hg)	max.	1,05	1,5
Nickel (Ni)	max.	0,75	3
Lead (Pb)	max.	3,5	4,5
Antimony (Sb)	max.	6	7,5
Selenium (Se)	max.	6	7,5

NOTE Other chemical parameters and indicator parameters are not relevant in sodium chloride, but there might be other parameter limits related to equipment performance, and some of these are listed in Annex A.

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### 5 Test methods

#### 5.1 Sampling

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A test sample of about 500 g shall be taken for analysis, ensuring that it is representative of the whole batch, and taking account of ISO 3165 and also ISO 6206. Prepare the laboratory sample(s) required in accordance with ISO 8213.

#### 5.2 Analyses

##### 5.2.1 Main product

The mass fraction in % of sodium chloride (NaCl) shall be determined by calculation, on the basis of the results of the determinations of sulfate according to ISO 2480, halogens according to ISO 6227, calcium and magnesium according to ISO 2482 and loss of mass on drying according to ISO 2483. Convert sulfate to calcium sulfate and unused calcium to calcium chloride, unless sulfate in sample exceeds the amount necessary to combine with calcium, in which case convert calcium to calcium sulfate and unused sulfate to first to magnesium sulfate and the remaining sulfate to sodium sulfate. Convert unused magnesium to magnesium chloride. Convert unused halogens to sodium chloride. Report the sodium chloride contents on a dry matter basis, multiplying the mass fraction in % of sodium chloride by  $100/(100 - P)$ , where  $P$  is the percentage of the loss of mass on drying (see 5.2.2.2).

##### 5.2.2 Impurities

###### 5.2.2.1 Water-insoluble matter

The content of water-insoluble matter shall be determined in accordance with ISO 2479.

###### 5.2.2.2 Moisture content

The loss of mass at 110 °C shall be determined in accordance with ISO 2483.